

# **Impact of Financial Strategy on Firm Performance**

## **“Cement Industry Bangladesh”**

By

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A thesis submitted to the Department of BRAC Business School in partial fulfillment of  
the requirements for the degree of  
Master of Business Administration (MBA)

BRAC Business School  
Brac University  
July 2024

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## **Declaration**

It is hereby declared that

1. The work of this thesis submitted is my own authentic work as a partial requirement of MBA at Brac University.
2. This study does not contain any component which is previously published or work of a third party, until this is properly referenced with complete and precise citations.
3. The work of this thesis is free from any component which has been accepted or submitted for any other degree or diploma at a university or other institution.
4. I have acknowledged all main sources of help.

**Student's Full Name & Signature:**

*Rajib Ahmed*

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## Approval

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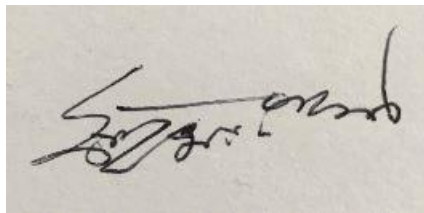
of Spring, 2024 has been accepted as satisfactory in partial fulfillment of the requirement for  
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## Letter of Transmittal

11<sup>th</sup> July, 2024

Prof. Dr. Saad Md Maroof Hossain  
Department of Brac Business School  
Brac University, Bangladesh

***Subject: Thesis Paper on “Impact of Financial Strategy on Firm Performance in the Cement Industry”***

Dear Sir,

This is my pleasure to present the required BUS699; Thesis Paper/Internship, “Impact of Financial Strategy on Firm Performance-Cement Industry ” for which I was assigned by your instruction.

I did my best to finalize the report with the most important facts and recommendations in the most compact and comprehensive way feasible.

I am certain that the report will fulfill your expectations.

Sincerely yours,

Md. Rajib Ahmed (20364029)

BRAC Business School BRAC University

Date: 11/07//2024

## Executive Summary

The purpose of this study is to construct a clear understanding of the impact that the dividend policy and capital structure has on the value of the firm. The analysis was carried out on a total 07 companies operating in Cement that are listed under Dhaka stock Exchange of Bangladesh for 3 consecutive years 2020-2022. For the benefit of this study i have used two different models & The purpose of this study is to establish the direct & indirect relationship between various financial and profitability factors to the value of the firm and how these components affect the profitability & value of the firm hence this study also uses a path analysis process in order to establish the indirect effects through a mediation variable ROA(return on asset) of these various elements of financial line items on the market value of the firm(Tobin's Q). Ordinary Least Square (OLS) technique of regression method was employed for analysis. As a component of the capital structure, Debt financing has significant impact on the value of the firm and maintaining a stable dividend policy does enhance the investors' confidence which in turn increases the value of the firm. Ergo the analysis of this research proves the hypothesis of pecking order & trade-off theory in case of capital structure and signaling theory in case of dividend policy.

## *Introduction*

The contemporary business landscape is intricately woven with the strategic tapestry of financial decisions that underpin the performance and sustainability of organizations across diverse industry. In the realm of the Cement sector, the relationship between financial strategy and firm performance stands as a focal point, steering the course of growth, resilience, and competitiveness within the industry.

This thesis paper seeks to explore and analyze the profound impact of financial strategies on firm performance within the realms of Cement industry. To elucidate this relationship, a comprehensive examination encompassing descriptive analysis, correlation analysis, and regression analysis has been undertaken.

The descriptive analysis conducted for this study involved an in-depth exploration of key variables pertinent to the financial landscape of the aforementioned industry. The following variables were scrutinized: Return on Assets (ROA), Earnings per Share (EPS), Tobins'Q(TQ), Dividend Payout Ratio (D/P), Short-Term Solvency (SCS) and Long-Term Solvency (LCS) and Log of Total Assets (Log of TA).

In addition to the descriptive statistics, correlation analysis was conducted to discern the relationships and interdependencies among these variables. This analysis aimed to uncover potential correlations between financial strategies and firm performance metrics within the Cement industry.

Furthermore, the study delves into regression analysis, seeking to model and quantify the influence of financial strategies on the performance of firms within the industry. Through regression modeling, this paper aims to offer predictive insights into how specific financial strategies might impact key performance indicators within the sampled companies.

In essence, this comprehensive analysis endeavors to contribute to the understanding of the intricate nexus between financial strategy and firm performance in the Cement industry, offering valuable insights for stakeholders, practitioners, and scholars in the field

## *Objective*

The primary objective of this thesis paper is to analyze and elucidate the relationship between financial strategies implemented within the Cement industry and their subsequent impact on firm performance. The study aims to achieve the following specific goals:

***Examine Financial Strategies:*** Investigate and categorize the various financial strategies adopted by companies operating in the Cement sector of Bangladesh, encompassing aspects such as capital structure, investment decisions, dividend policies, and financial risk management.

***Evaluate Firm Performance Metrics:*** Assess key performance indicators, including Return on Assets (ROA), Earnings Per Share (EPS), Tobins' Q (TQ), Dividend Payout Ratio (D/P), Short-Term and Long-Term Solvency (SCS, LCS), and Log of Total Assets (Log of TA) across sampled companies within cement industry.

***Conduct Descriptive and Correlation Analysis:*** Undertake detailed descriptive analysis to comprehend the central tendencies and variability of the aforementioned performance metrics.

***Apply Regression Analysis:*** Employ regression modeling to delineate the influence of specific financial strategies on firm performance indicators within the Cement industry. This analysis aims to provide predictive insights into how these strategies impact key performance metrics.

***Provide Insights and Recommendations:*** Synthesize the findings from the analyses conducted and draw conclusions and offer strategic insights and recommendations that can aid industry practitioners and stakeholders in optimizing financial decision-making processes for improved performance outcomes.

In essence, this study endeavors to bridge the gap between financial strategies and firm performance, offering a comprehensive understanding of how strategic financial decisions influence the operational and financial success of companies in the Cement sector.



## *Literature Review and Hypotheses*

According to Titman et al. (2011), financial management is the process by which individuals and organizations assess their capital raising and investment portfolios in order to fund business operations. In order to increase revenue in the future, all management stakeholders must educate themselves on subjects including organizational behavior, human relations, strategic planning, and personnel. These subjects collectively address how money is used today.

Three key questions in management underpin decision-making behavior: (1) Capital budgeting- which investment should be selected considering long-term prospects? (2) Capital structure- What type of finance should the business consider for its operation? (3) Working capital management- In order to carry out day-to-day operations, what is the effective way of managing cash flow?

According to agency theory's later evolution, a business that divides its ownership and management responsibilities is more susceptible to agency conflicts. This results from the manager acting as an agent and the shareholders acting as principals in different roles. When it comes to the ultimate distribution of investor funds, the management will hold a sizable controlling stake. According to Titman et al. (2011), managers who own little or no business stock will be less driven and excited to pursue the interests of the company's owners. Managers will behave in their own best interests and for other personal financial gain.

Because dividend payments lessen tensions between shareholders and management, they can lower agency costs. The payment of dividends indicates to investors that the management is already doing a good job of running the business and may encourage them to make additional investments. According to Easterbrook (1984), the manager's power will be diminished as a result of the dividend payment because it will cut into the sources of funds under their control. As a result, the dividend payment process is comparable to capital market monitoring, which took place when the business raised additional funding from outside sources to lower agency expenses.

This has been clear that agency problem can be reduced through the distribution of dividend to the shareholders, but studies has shown that the relationship between dividend and the firm value is quite questionable. It is argued by Miller and Modigliani (1961) in Brigham and Houston (2011) that establishing relationship between dividend policy & firm value has no

relevance when the market assumptions are perfect and behaviors are rational and with certainty. But in real market, establishing dividend policy losing one or more assumptions of a perfect capital market makes the theories contrary to the dividend policy.

According to Brigham and Houston (2011), the seminal financial publications by Professor Franco Modigliani and Merton Miller in 1958 marked the beginning of the theory of contemporary capital structure. Under a very narrow set of assumptions, the idea that the capital structure has no effect on the business value is proven. Stated differently, the theory's findings demonstrate that a business that finances its activities will be meaningless, making the capital structure irrelevant.

Studies on this hypothesis, however, are predicated on a number of unrealistic assumptions, such as the following: 1) No taxes, 2) No brokerage fees, 3) No bankruptcy costs, 4) Investors can borrow money from companies at the same rate, 5) All investors have access to the same information regarding the company's future investment opportunities, and 6) The use of debt has no impact on EBIT.

The outcome of this irrelevant theory has a very significant significance, even if some of these assumptions are obviously implausible. This theory has affected the company value by illuminating the circumstances under which the capital structure is irrelevant and by offering hints as to what prerequisites must be met for the capital structure to become relevant. This theory's development signaled the start of contemporary capital structure research, with subsequent studies concentrating on reducing the theory's presumptions in order to create a more realistic capital structure theory.

Stulz (1990) discovered data indicating a positive correlation between the debt ratio and firm value in companies with limited expansion opportunities. In businesses with significant room for expansion, the debt-to-value ratio is inversely correlated with business value. As a result, the impact of debt on a company's value is strongly correlated with the presence of growth prospects. According to Dennis (2006), the most effective technique for determining the company's overall financial status is financial ratio analysis.

Investors frequently use dividend policy as a cue when evaluating the company's qualities. This is because the stock price of the company could be impacted by the dividend policy. Diverse perspectives exist about the impact of dividend policy on firm value. For example, the dividend irrelevance argument, put forth by Brigham and Houston (2011), holds that a company's dividend policy has no bearing whatsoever on its cost of capital or value. Miller and Modigliani

clarified that the dividend payment ratio is just a detail that has no bearing on shareholder wealth and is dependent on the investment decisions made by corporations. The only factors that determine a company's value are its investment program and its capacity to turn a profit from its assets. The distribution of profits between retained earnings and dividends will not impact the value of the company.

### *Hypothesis Creation:*

#### *Hypothesis 1: Whether Dividend Policy affects the value of the firm*

The study is based on the Cement industry in Bangladesh. The main objective of the study is to critically examine the impact of dividend policy on the value of the firm. How much of the profit to be distributed among the shareholders is determined through the use of dividend policy. It is important to establish a policy of distributing dividend where it is determined whether cash generated by business will be distributed among the investors or will be further reinvested in the business for growth. How much of the dividend will be distributed among the shareholders depends on the policy of the company. Important models supporting dividend relevance are given below.

#### *As per Walter's Theory:*

- The company uses its retained earnings to finance its business entirely, does not consider any external sources of finance.
- The use of new sources of funds does not change the risk level of the business. Where firms' cost of capital and the internal rate of return remain constant.
- EPS & DPS remains Constant at initial stage but the value for EPS & DPS depends on the choice of the model where it is assumed that values used for any assumptions to be remain constant.

### *Gordon's Model:*

Myron J. Gordon has established a model where investors tend to be risk averse as incomes in the form of dividends are certain as opposed to income generated from capital gain, therefore shareholders of any business consider the capital gain portion to be a risky obligation. Capital gains generated in future are normally discounted using a higher rate than the earnings of the company which leads to a higher value of the share. More concisely as the retention rate of any company increases this indulges the idea of use of higher discount rate.

### *Hypothesis 2 Whether Capital Structure Affects the Value of firm?*

The topic of whether capital structure influences a firm's value is one that cannot simply be answered due to the complexity of the link between the value of the firm and capital structure. While some studies have identified a negative association, others have found a favorable one between capital structure and business value. Others have not discovered any relationships at all.

*The trade-off theory* is one of the most popular ideas used to explain the connection between capital structure and business value. According to the trade-off idea, there is a trade-off between the advantages and disadvantages of debt. On the one hand, a company's return on equity may rise if debt is a more affordable source of funding than equity.

A company's weighted average cost of capital (WACC) can be minimized by using the best possible capital structure. The average cost of all the capital used by a company to finance its operations is known as the WACC. Up to a certain extent, a firm's debt-to-equity ratio will cause its WACC to drop. On the other hand, the firm's financial risk would escalate and its WACC will begin to climb if its debt-to-equity ratio rises too high.

There exist many theories that elucidate the correlation between capital structure and firm value, apart from the trade-off hypothesis. This link can also be explained by other hypotheses, such as the signaling hypothesis and the pecking order theory.

According to the *pecking order principle*, businesses will rather use internal resources like retained earnings to support their activities. In the event that internal finances are not available, businesses will issue debt to raise money. Equity will be distributed as a very last option. According to the pecking order theory, investors may view companies with high debt-to-equity ratios as riskier, which could lead to lower share prices.

Firms in the cement industry are valued mostly based on their capital structure. How to do it is as follows:

***High capital intensity:*** These sectors heavily rely on debt financing because they need to make large investments in infrastructure, machinery, and other capital goods. Debt can provide quick access to finance for modernization and expansion at a lower cost than equity. Profitability may rise as a result, and the company may become more valuable.

***Nature of cycles:*** Economic cycles affect the demand for Cement. Debt finance can spur growth and expansion during times of high demand, taking advantage of advantageous market conditions. High debt levels, however, can put a strain on resources during downturns if interest payments become onerous.

## *Methodology:*

### *Process Steps*

#### Sample

The purpose of this study is to examine whether capital structure of the firm & dividend policy influences the value of the firm. In doing so, I have collected a sample of firms that have been listed on the DSE Bangladesh over three consecutive years from 2020-2022. My targeted industries for the respective study were Cement industry. There are a total of 7 companies listed under DSE from these three industries. I have considered all the companies from their respective industries in order to get a proper understanding of the respective study.

#### Data

The population of study is made up of all the 7 companies quoted on the Dhaka stock Exchange & Chittagong Stock Exchange as on November 2023 for the financial year 2019-2020, 2020-2021 & 2021-2022.

The study has adopted a cross-sectional survey research design. Because the collection of data considered in this study were selected at a particular point of time for three successive years. The sample was made up of all the companies quoted on the Dhaka Stock Exchange as at 30th July 2022. The secondary source of data was employed. The data were derived from the Annual reports & their published Audited Financial Statements of the listed companies.

#### Data Analysis

The study uses accounting measures of performance such as Return of Assets (ROA), Earnings per Share (EPS) & TOBINS'Q as dependent variables & the independent variables used include dividend payout ratio, a proxy for firm size is the logarithm of total assets to control for size difference across the sample firms. The firm's leverage is also measured as short-term capital structure & long term capital structure. I tried to examine the relationship between these variables and how these variables are related which demonstrates an obvious relationship between the firms' value & the respective financial line items used in order to derive these financial & profitability ratios.

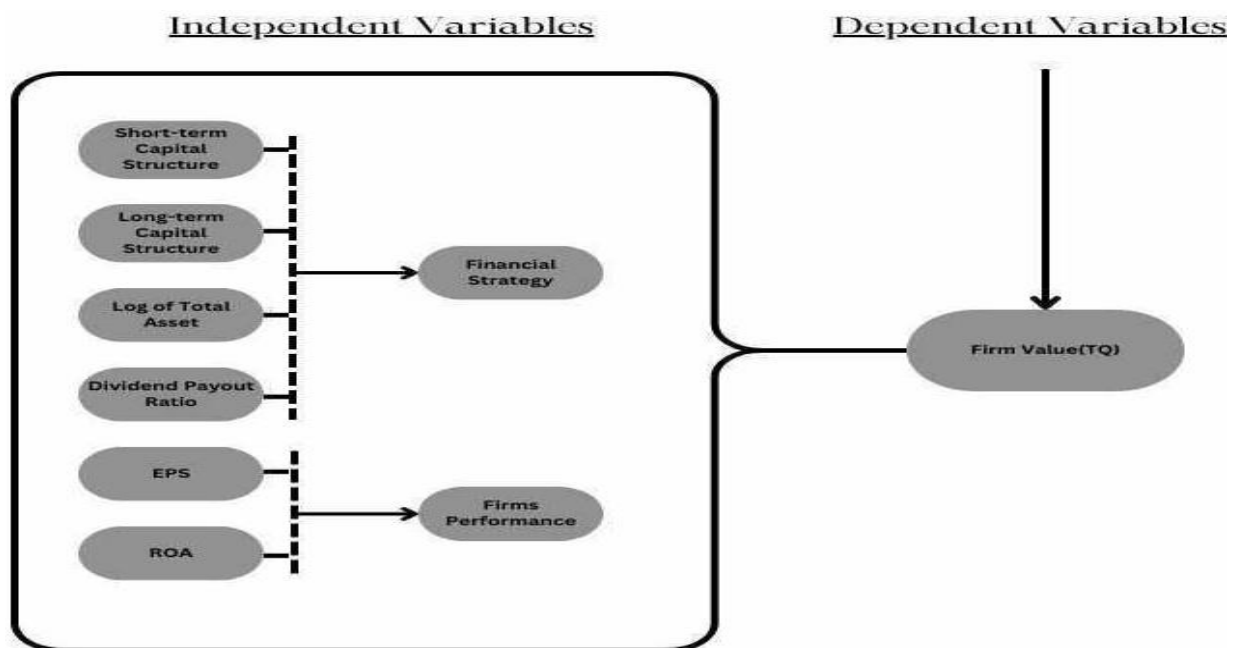
Final Report

### Models and Variables:

The study has adopted the method of regression analysis. To be specific the technique of ordinary least squares is adopted as the study intends to examine the relationship between the value of the firm with capital structure and dividend policy, this method is appropriate for the analysis of collected data.

### The study considered two Hypotheses:

- *Hypothesis 1: Dividend policy affects the firm/does not affect the firm.*
- *Hypothesis 2: The effect of capital structure in the value of the firm.*



Theoretical Framework of the study.

### Model Specification:

The models to be regressed in this study are presented in a relational form as follows:

- $TQ_{it} = \alpha + \beta_1 DP_{it} + \beta_2 STCS_{it} + \beta_3 LTCS_{it} + \beta_4 CSIZ_{it} + \beta_5 EPS_{it} + \beta_6 ROA_{it} + \epsilon_{it} \dots\dots\dots$
- $ROA_{it} = \alpha + \beta_1 DP_{it} + \beta_2 STCS_{it} + \beta_3 LTCS_{it} + \beta_4 CSIZ_{it} + \beta_5 EPS_{it} + \epsilon_{it} \dots\dots\dots$

### *Where,*

- ✓  $TQ_{it}$  = Firms Performance
- ✓  $DP_{it}$  = Dividend payout ratio of company i at time t
- ✓  $STCS_{it}$  = Short Term Capital structure for company i at time t
- ✓  $LTCS_{it}$  = Long term capital Structure for company i at time t
- ✓  $CSIZ_{it}$  = Firm size (SIZE), measured by the natural logarithm of total assets of the company i at time t
- ✓  $EPS_{it}$  = Earnings per share of company i at time t
- ✓  $ROA_{it}$  = Return on asset of company i at time t
- ✓  $\alpha$  = intercept of the regression line which is constant
- ✓  $\beta_1$  to  $\beta_7$  = coefficient of slope of independent variables and
- ✓  $\epsilon_{it}$  = error term for company i at time t



## *Findings and Analysis*

### *Descriptive Analysis:*

My Concerned areas of study were Cement industry for which i have collected data for three consecutive years from 2020-2022. This part tries to demonstrate fundamental characteristics of data such as their means, standard deviations, minimum and maximum value in a given set of data.

*Table-01: Descriptive statistics of Cement Industry*

<b>Industry</b>	<b>Number of Observation</b>	<b>Variables</b>	<b>Mean</b>	<b>SD</b>	<b>Min</b>	<b>Max</b>
Cement	19	<b>D/P ratio</b>	15%	11%	5%	48%
		<b>ROA</b>	2%	8%	-19%	15%
		<b>Short term CS</b>	48%	15%	23%	76%
		<b>Long Term CS</b>	22%	14%	5%	46%
		<b>EPS</b>	1.08	6.93	-16.88	15.86
		<b>TQ</b>	157%	72%	90%	312%
		<b>Log of TA</b>	23.32	0.74	22.18	24.81

Table-01 represent the characteristics of the data that includes total no. of population, their means, standard deviations & their respective minimum and maximum values of Cement companies that are listed under Dhaka stock exchange for the year 2020-2022.

There are a total of 7 cement companies listed under Dhaka stock exchange and my concerned period of study was 3 consecutive years which totals 21 observations for this industry. For the benefit of data accuracy and consistency of one variable to another i have excluded those observations which do not provide any input for the respective study such as not paying dividend in any particular year, which led us to carry out my study for this industry with a set of 19 populations.

From the analysis of different profitability & financial ratios, Tobin's Q & Log of TA is showing highest standard deviation among all the variables, both of these two ratios measure the size(value) of the firm & from the study of their respective mean and standard deviation it can be concluded that companies within cement industry varies in respect to their relative size.

I can see that EPS standard deviation 6.93 signifies that probability is very much volatile and unpredictable for Cement industry companies. It means profit of this industry is very much unstable at different periods of time and also between companies. ROA showing least standard deviation of 0.08 among all the variables, which indicates that all the companies in the cement industry are efficiently using their assets in order to generate profit and this is common among the companies. Study of DP Ratio has revealed that industry wide average dividend payout ratio is around 15% and its standard deviation indicates this may fall above or below 10.89%. Overall considering all the variables used for the analysis of cement industry this is quite obvious that data observed for Cement industry is quite spread out. There is a high variability in terms of profit, capital structure or total firm size among companies within this industry.

### Correlation Analysis:

In order to determine the degree to which one variable is linearly related to another, the study has used correlation analysis. A statistical tool used to examine the extent of connection between variables.

As part of the descriptive analysis I have conducted correlation analysis between different elements of the financial statements of various companies from the cement industry. Which is the cement industry. I have collected data for 3 consecutive years from 2020 to 2022 for every company within the respective industry that is listed under DSE & CSE of Bangladesh.

<i>Table-02: Correlation analysis of Cement Industry</i>			
Variables	ROA	EPS	TQ
D/P Ratio	59.31%	44.53%	60.65%
Short Term CS	-61.85%	-51.50%	-70.58%
Long Term CS	-12.76%	12.42%	-10.97%
Log of Total Assets	33.67%	48.16%	-3.68%

From the analysis of correlation results, I have observed positive correlation of D/P ratio with ROA, EPS & TQ which is 59.31%, 44.53% & 60.65% respectively. This clearly justifies that the payment shareholder receives in the form of dividend, depends on the company's ability to earn profit and its market value also increases whenever company generates more profit and pays dividend to its shareholders. I have also observed a positive relationship of EPS with Long

term Capital structure of the firms and its relative size (LN), where EPS-long term CS has a positive relation of 12.42% and Logarithm of total assets-EPS holds a positive relation of 48.16%. From this analysis of the relationship of EPS with firm's capital structure & its relative size, it is obvious that size of the firm has a linear relationship with its earning ability which is also justified by its long term debt position in comparison to its book value of asset.

In the analysis of the firm's short term capital structure, I have observed a strong negative relationship of Short term CS with ROA, EPS & Tobins'Q, which is -61.85%, -51.50% & -70.58% respectively. This indicates that as the company's Short-term debt increases, its ROA, EPS & its market value decreases. Excessive short-term debt can raise interest costs and cause liquidity problems. ROA may decrease if the cost of servicing this debt surpasses the returns on assets(ROA). This is because current liabilities are a fixed cost that must be paid regardless of the company's profitability & as these liabilities are taken for a shorter term which has usually higher interest rate than the long term debt which reduces the profitability of any firm by reducing net income of the firm. As the short term debt of any company increases the cash flow management of the company gets complicated which raises concerns about liquidity risk and financial stability and the investors may perceive such companies as riskier leading to lower valuation.

I have also observed a negative relationship of ROA (return on assets) with long term Capital structure which is -12.76%. This indicates that as the company's debt increases, its ROA decreases. This is because debt is a fixed cost that must be paid regardless of the company's profitability. As a result, the more debt a company has, the more interest it must pay, which in turns reduces its net income & ROA. There is also Negative correlation between Long term capital structure & TQ (10.97) which indicates that the investors are concerned about the company's financial health and future prospects or the company is being overvalued by its investors.

## **Regression Analysis**

The regression analysis used in this study is multiple linear regression analysis with two regression model to find the direct & indirect relationship between dependent variable & independent variable through a mediator variable to determine the indirect relationship.

### ***Direct Relationship:***

The direct relationship between independent variables & dependent variable which is firm value represented by Tobin's Q measured by market value to its book or replacement value.

<b>SUMMARY OUTPUT</b>	
<i>Regression Statistics</i>	
Multiple R	0.92
R Square	0.86
Adjusted R Square	0.78
Standard Error	0.34
Observations	19.00

### ***Coefficient of determination (R Square)***

The result of R square in this test is .86. This indicates that 86% of firms' values are explained by the variables used in the model. Which means Tobin's Q value is 86% influenced by independent variables (D/P ratio, Short-term CS, Long-term CS, Log of total Assets, EPS & ROA). While the remaining 14% influences are explained by other variables, they are not considered in this model.

### ***Result of F-Test:***

<b>ANOVA</b>					
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	6.00	8.20	1.37	11.81	0.000198
Residual	12.00	1.39	0.12		
Total	18.00	9.59			

**Dependent variable:** Tobin's Q (Market value of the firm) **Independent Variables:** D/P ratio, Short-term CS, Long-term CS, Log of total Assets, EPS & ROA **Source:** Data processed with XLMiner Data tool pack

The significance value of 0.000198 which is less than .05, so i accept the hypothesis and it can be stated that variables used in this test jointly affect firms value (tobin's Q) so the model used is appropriate.

**Coefficients:**

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95%	Upper 95%
Intercept	10.77	3.59	3.00	0.01	2.95	18.59	2.95	18.59
D/P ratio	1.86	1.04	1.79	0.10	-0.40	4.13	-0.40	4.13
Log of total assets (CSIZ)	-0.33	0.14	-2.28	0.04	-0.64	-0.01	-0.64	-0.01
Short term CS	-3.71	0.98	-3.79	0.00	-5.85	-1.58	-5.85	-1.58
Long Term CS	-0.45	0.77	-0.58	0.57	-2.13	1.24	-2.13	1.24
ROA	-0.05	0.02	-2.46	0.03	-0.09	-0.01	-0.09	-0.01
EPS	3.60	1.70	2.12	0.06	-0.10	7.29	-0.10	7.29

*Dependent variable:* Tobin's Q(Market value of the firm) *Independent Variables:* D/P ratio, Short-term CS, Long-term CS, Log of total Assets, EPS & ROA *Source:* Data processed with XLMiner Data tool pack

**Based on the output of regression test, the equation can be as follows:**

$$TQ_{it} = \alpha + \beta_1 DP_{it} + \beta_2 STCS_{it} + \beta_3 LTCS_{it} + \beta_4 CSIZ_{it} + \beta_5 EPS_{it} + \beta_6 ROA_{it} + \epsilon_{it} \dots$$

$$TQ_{it} = 10.77 + 1.86 DP_{it} - 0.33 CSIZ_{it} - 3.71 STCS_{it} - 0.45 LTCS_{it} - 0.05 ROA_{it} + 3.60 EPS_{it} + \epsilon_{it} \dots$$

- $\alpha = 10.77$ , means if all independent variables used in this test is equal to 0 then firms value would be equal to 10.77
- $\beta_1 DP_{it} = 1.86$ , means that if dividend payout ratio experienced an increase of 1 percent then firm value would be increased by 1.86 with the condition of all the other independent variables staying the same.
- $\beta_2 STCS_{it} = -3.71$ , indicates that the value of the firm and short term capital structure has negative/opposite relationship among these two variables. If all the other variables stays same and the firm's short term capital structure experiences an increase of 1% then the firm's value would decreased by -3.71.

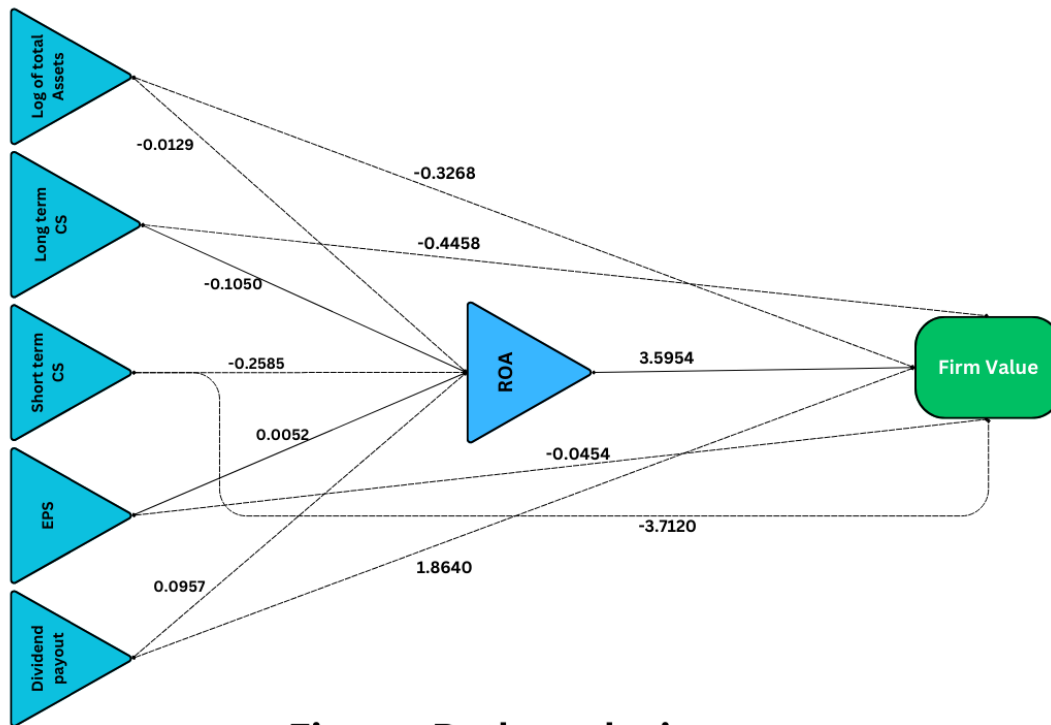
- $\beta_{3LTCSit} = -0.45$ , means an increase of 1% increase in long term capital structure of firm would have an impact of -0.45 on the firm's value with all the other variables staying the same.
- $\beta_{4CSIZit} = -0.33$ , indicates that the firm's size negatively impacts the market value of the firm, means if Firms Size (LN of total asset) is increased by 1% then the firm's market value compare to its book value would decrease by -0.33 this value. Assuming that all the other independent variables used in this test are constant.
- $\beta_{5EPSit} = 3.60$ , means firms profitability has a positive relationship with its market value (Tobin's Q). This direct relationship of EPS & Tobin's Q indicates that as earnings per share increases, market value compared to book value also increases by 3.60 and vice versa.
- $\beta_{6ROAit} = -0.05$ , this demonstrates a negative relationship between ROA & Tobin's Q. If there is a 1% increase in return on assets(ROA), the market value of the firm(Tobin's Q) would experience a decrease of -0.05 assuming all the other variables in these tests are constant.

**Path analysis (Indirect Relationship):**

In this part of analysis i tried to examine the indirect relationship between Dependent variables (tobin's Q) and independent variables (D/P ratio, Short-term CS, Long-term CS, Log of total Assets & EPS) through a mediator variable (ROA).

No.	Variables relationship	Casual Effect		
		Direct Effect	Indirect Effect through ROA	Total
1	D/P ratio → Tobin's Q	1.8640	(0.0957*3.59)= 0.3442	2.2082
2	D/P ratio → ROA	0.0957		0.0957
3	Log of total assets → TObin's Q	-0.3268	(-0.0129*3.59)= -0.0464	-0.3732
4	Log of total assets → ROA	-0.0129		-0.0129
5	Short Term CS → Tobin's Q	-3.7120	(-0.2585*3.59)= -0.9296	-4.6415
6	Short Term CS → ROA	-0.2585		-0.2585
7	Long Term CS → Tobin's Q	-0.4458	(-0.1050*3.59)= -0.3775	-0.8234
8	Long Term CS → ROA	-0.1050		-0.1050
9	EPS → Tobin's Q	-0.0454	(-0.0052*3.59)= 0.0188	-0.0267
10	EPS → ROA	0.0052		0.0052
11	ROA → Tobin's Q	3.5954		3.5954

*Dependent variable:* ROA & Tobin's Q(Market value of the firm) *Independent Variables:* D/P ratio, Short-term CS, Long-term CS, Log of total Assets, EPS & ROA *Source:* Data processed with XLMiner Data tool pack



**Figure: Path analysis**

The use of Path analysis helped analyze a different model that takes into consideration profitability as a dependent variable to examine the relationships of the same variables to compare different models to determine which one best fits the data. In determining whether the independent variable has any effect on the dependent variable (tobin's Q) of this model that is mediated by one profitability variable (ROA), i have come up with following result:

**Analysis results (Path analysis):**

*The effect of Log of total asset on ROA & Indirect effect on Market value (TObin's Q) through ROA:* From the analysis of the second model of regression test, Log of total asset has a negative linear relationship with ROA. The coefficient for Log of total asset is -0.0129, which means for a 1% change experience by log of total asset has a negative effect of -0.0129 on ROA assuming the other entire variable constant. Analysis also reveals that the indirect effect of Log of total asset on market value of firm (tobin's Q) through ROA is about -0.0464,

which means 1% changes in Log of total assets has a negative effect on market value of the firm (Tobin's Q) through ROA or Market value (Tobin's Q) would decrease by -0.0464.

***The effect of Short-term CS on ROA & Indirect effect on Firm value through ROA:***

Hypothesis test shows that short-term capital Structure has a linear relationship with ROA & market value of the firm (Tobin's Q) through ROA. Short term CS has a coefficient of -0.2585 for Return on asset (ROA). Which means 1% changes in Short term capital structure has a negative impact of -0.0905 on return on assets keeping in mind that all the other variables are constant. In terms of indirect effect, analysis revealed a negative relation of short term capital Structure has on market value of the firm (tobin's Q) with coefficient of -0.9296. Which means if there is a 1% change in Short term capital structure of the firm, the market value of the firm (tobin's Q) would change by -0.9296 through profitability (ROA).

***The effect of Long-term CS on ROA & Indirect effect on Market value (Tobin's Q) through ROA:***

Further analysis of capital structure which is focused on Long term liability of the firm has revealed a coefficient of -0.1050 on ROA. This indicates a negative relation between Long term CS & ROA. For a increase of 1 unit in long term CS, Return on asset would experience a decline of -0.1050 or vice versa in terms of profitability. On the other hand, long term CS has revealed a coefficient of -0.3775 for Market value of the firm (TObin's Q) from the analysis of indirect relationship. Which means if 1% increase experience by long term CS of the firm then market value of the firm (tobin's Q) would decrease by -0.3775 through profitability.

***The effect of EPS on ROA & Indirect effect on Firm value through ROA:***

Analysis of EPS has showed positive coefficient for ROA and also for market value (tobin's Q) through ROA which is a measure of indirect effect of EPS on market value of the firm. Regression analysis showed a coefficient of 0.0052 for ROA, which demonstrates a linear relationship between EPS & ROA. If EPS increases by 1%, return on assets would also increase by 0.0052. Analysis of relation through mediator variable (ROA) revealed that if EPS increases by 1% there would be an indirect impact on market value of the firm of 0.0188 in the same direction.

***The effect of Dividend Payout on ROA & Indirect effect on Firm value through ROA:***

Analysis of dividend policy reveals an linear relation with ROA, having a positive coefficient of 0.0957 indicates that 1% increase of D/P ratio would lead ROA increase by 0.0957 or vice versa. And the analysis of indirect effect shows a positive relationship between D/P & market value of the firm (tobin's Q) through mediator variable(ROA). This positive indirect effect through ROA of 0.3442 tells us that 1% increase in dividend payment would make market



value of the firm (tobin's Q) also increase by 0.3442 through the mediation variable of profitability(ROA).

### *Discussions:*

From the Analysis of regression results this can be concluded that the Short term & long term debt in the capital structure & D/P ratio is one of the major determinants of firm's value as this has a significant effect on the Market value of the firm measured by Tobin's Q. Both the direct and indirect analysis of this study reveals negative relation of the firm value with the firm's capital structure(debt) and its relative size(LN), This negative link between the firm's size as determined by the natural logarithm and its worth in terms of Tobin's q shows that as a firm grows, its value drops. This can happen for a number of reasons, including the declining returns to scale or inefficiencies related to greater board sizes. Bigger boards are typically linked to slower decision-making, less vigilant oversight, and a propensity for more cautious investment choices.

However, looking at the results of the analysis of EPS with the firms ROA, the positive relation of the EPS and the firms ROA demonstrates that the firms of Bangladesh's Cement industries are efficiently utilizing their assets to generate profits which reflects in their higher ROA and consequently to a higher EPS. But the relationship of these firms EPS and their value of the firm which is measured by Tobin's Q is negative and this can be the reason of the perceptions of the participants of the secondary market, they may perceive the cement industry of Bangladesh has low growth prospects or the companies operating within the respective industries are overvalued therefore the firms market value relative to the replacement cost of its assets decreases even as its EPS and TOA increases.

## *Conclusion:*

The research work has examined Dividend policy & capital structure theory and its relationship with the value of the firm that are operating the market of Bangladesh. I have examined a total of 7 Companies from Cement Industry of Bangladesh that are listed in Dhaka Stock Exchange for 3 consecutive Fiscal Periods of 2020-2022. I tried to examine both the direct & indirect effect of different financial & profitability metrics on the value of the firm directly and through profit earnings capability in order to conclude on my prior established hypothesis. Based on the findings of this study i can conclusively say that the use of debt in the capital structure and paying dividend has a significant effect on the firm that is operating in Bangladesh. It is recommended that firms are strongly advised to always consider the marginal benefit of using debt in the capital structure to the marginal cost of using such debt before considering the use of debt as financing their operations. And highly recommended of using a stable dividend policy, as this shows confidence of future earnings prospects which has a positive effect on the firm's market capitalization hence the total value of the firm.

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## Appendix:

**Table 1 Data collected Cement Industry Bangladesh**

Year	Name of the company	Industry	D/P ratio	Dividend yield	Total Assets (TA)	Log of total assets (CSIZ)	Current Liabilities (CL)	Long Term Liabilities (LTL)	Short term CS	Long Term CS	ROA	EPS	TQ	Market Capitalization	Share Price
2019-20	Crown Cement PLC	Cement	10.00%	2.28%	19,084,839,000.00	23.67	10,419,743,000.00	1,777,980,000.00	54.60%	9.32%	-0.69%	-0.89	0.98	6,513,157,894.74	43.86
2020-21	Crown Cement PLC	Cement	20.00%	2.79%	16,989,283,000.00	23.56	8,165,593,000.00	999,600,000.00	48.06%	5.88%	5.06%	5.79	1.17	10,645,161,290.32	71.68
2021-22	Crown Cement PLC	Cement	10.00%	1.28%	17,887,287,000.00	23.61	9,698,196,000.00	886,075,000.00	54.22%	4.95%	-1.28%	-1.54	1.24	11,601,562,500.00	78.13
2019-20	Premier Cement Mills Ltd.	Cement	10.00%	1.64%	4,291,300,000.00	22.18	1,628,420,000.00	1,858,760,000.00	37.95%	43.31%	6.27%	2.55	2.31	6,421,905,000.00	60.98
2020-21	Premier Cement Mills Ltd.	Cement	20.00%	2.70%	5,092,440,000.00	22.35	1,901,390,000.00	2,334,940,000.00	37.34%	45.85%	12.80%	6.18	2.37	7,811,111,111.11	74.07
2021-22	Premier Cement Mills Ltd.	Cement	10.00%	2.14%	5,838,380,000.00	22.49	2,915,520,000.00	2,109,130,000.00	49.94%	36.13%	-19.33%	-10.70	1.70	4,927,570,093.46	46.73
2019-20	HeidelbergCement Bangladesh Ltd.	Cement	20.00%	1.34%	9,144,000,000.00	22.94	3,658,167,000.00	1,552,007,000.00	40.01%	16.97%	-0.88%	-1.43	1.49	8,433,371,641.79	149.25
2020-21	HeidelbergCement Bangladesh Ltd.	Cement	26.00%	0.95%	9,235,000,000.00	22.95	4,277,424,000.00	1,223,742,000.00	46.32%	13.25%	5.15%	8.41	2.27	15,464,140,421.05	273.68
2021-22	HeidelbergCement Bangladesh Ltd.	Cement	10.00%	0.56%	8,780,000,000.00	22.90	4,471,318,000.00	914,528,000.00	50.93%	10.42%	-2.66%	-4.13	1.76	10,089,926,785.71	178.57
2019-20	LafargeHolcim Bangladesh Ltd.	Cement	10.00%	2.09%	26,218,984,000.00	23.99	5,940,501,000.00	2,989,408,000.00	22.66%	11.40%	8.99%	2.03	2.46	55,568,110,047.85	47.85
2020-21	LafargeHolcim Bangladesh Ltd.	Cement	25.00%	3.52%	29,622,000,000.00	24.11	7,153,132,000.00	2,675,107,000.00	24.15%	9.03%	13.09%	3.34	3.12	82,483,913,352.27	71.02
2021-22	LafargeHolcim Bangladesh Ltd.	Cement	48.00%	7.41%	28,971,000,000.00	24.09	8,916,773,000.00	2,344,376,000.00	30.78%	8.09%	15.35%	3.83	2.99	75,230,672,064.78	64.78
2019-20	Confidence Cement	Cement	15.00%	1.55%	29,061,904,490.00	24.09	15,079,643,316.00	7,071,073,940.00	51.89%	24.33%	1.63%	8.30	1.04	7,949,658,193.55	96.77
2020-21	Confidence Cement	Cement	25.00%	1.85%	42,712,725,076.00	24.48	14,722,639,538.00	14,655,201,869.00	34.47%	34.31%	2.90%	15.86	0.95	11,100,874,054.05	135.14
2021-22	Confidence Cement	Cement	5.00%	0.48%	59,642,913,269.00	24.81	29,801,171,822.00	15,284,789,799.00	49.97%	25.63%	0.19%	1.43	0.90	8,556,923,750.00	104.17
2019-20	Meghna Cement Mills	Cement	5.00%	0.69%	10,365,420,000.00	23.06	6,285,890,000.00	3,228,830,000.00	60.64%	31.15%	0.60%	2.08	1.13	2,180,022,753.62	72.46
2020-21	Meghna Cement Mills	Cement	5.00%	0.68%	12,979,240,000.00	23.29	6,007,550,000.00	5,057,820,000.00	46.29%	38.97%	0.63%	2.73	1.02	2,212,081,911.76	73.53
2021-22	Meghna Cement Mills	Cement	5.00%	0.72%	13,464,340,000.00	23.32	6627040000	5,178,450,000.00	49.22%	38.46%	0.44%	1.95	1.03	2,089,188,472.22	69.44
2019-20	Aramit Cement Limited	Cement			6,466,676,266.00	22.59	4,882,406,952.00	638,609,112.00	75.50%	9.88%	-3.59%	-6.86	0.92	403,172,000.00	11.90
2020-21	Aramit Cement Limited	Cement			7,002,097,459.00	22.67	5,273,584,049.00	741,643,863.00	75.31%	10.59%	0.29%	0.60	1.07	1,487,332,000.00	43.90
2021-22	Aramit Cement Limited	Cement	5.00%	0.02%	6,604,996,424.00	22.61	4,617,058,157.00	1,561,579,413.00	69.90%	23.64%	-8.66%	-16.88	1.10	1,067,220,000.00	2631.58

**Table 2 Regression Test 1- With Dependent variable TQ & considering rest of all are independent variables**

SUMMARY OUTPUT								
<i>Regression Statistics</i>								
Multiple R	0.92		0.92					
R Square	0.86		0.86					
Adjusted R Square	0.78		0.78					
Standard Error	0.34		0.34					
Observations	19.00		19.00					
ANOVA								
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>			
Regression	6.00	8.20	1.37	11.81	0.000198			
Residual	12.00	1.39	0.12					
Total	18.00	9.59						
	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95%</i>	<i>Upper 95%</i>
Intercept	10.77	3.59	3.00	0.01	2.95	18.59	2.95	18.59
D/P ratio	1.86	1.04	1.79	0.10	-0.40	4.13	-0.40	4.13
Log of total assets (CSIZ)	-0.33	0.14	-2.28	0.04	-0.64	-0.01	-0.64	-0.01
Short term CS	-3.71	0.98	-3.79	0.00	-5.85	-1.58	-5.85	-1.58
Long Term CS	-0.45	0.77	-0.58	0.57	-2.13	1.24	-2.13	1.24
EPS	-0.05	0.02	-2.46	0.03	-0.09	-0.01	-0.09	-0.01
ROA	3.60	1.70	2.12	0.06	-0.10	7.29	-0.10	7.29

*Table 3 Regression test-2: Considering ROA as dependent variable*

SUMMARY OUTPUT								
<i>Regression Statistics</i>								
Multiple R	0.80							
R Square	0.64							
Adjusted R Square	0.51							
Standard Error	0.06							
Observations	19.00							
<i>ANOVA</i>								
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>			
Regression	5.00	0.07	0.01	4.71	0.01			
Residual	13.00	0.04	0.00					
Total	18.00	0.11						
	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95%</i>	<i>Upper 95%</i>
Intercept	0.44	0.57	0.77	0.46	-0.80	1.68	-0.80	1.68
D/P ratio	0.10	0.17	0.57	0.58	-0.27	0.46	-0.27	0.46
Log of total assets (CSIZ)	-0.01	0.02	0.56	0.59	-0.06	0.04	-0.06	0.04
Short term CS	-0.26	0.14	1.81	0.09	-0.57	0.05	-0.57	0.05
Long Term CS	-0.11	0.12	0.85	0.41	-0.37	0.16	-0.37	0.16
EPS	0.01	0.00	1.97	0.07	0.00	0.01	0.00	0.01